



COVID-19 Outbreak Control and Prevention State Cell

Health & Family Welfare Department

Government of Kerala

GUIDELINES ON THE SETTING UP OF POST COVID CLINICS

[COVID 19 CONVALESCENT CLINICS]

No 31/ F2/2020/ Health- 28th October 2020

Post-acute covid-19 ("long covid") is multisystem disease, sometimes occurring even after a relatively mild acute illness. Post-acute covid-19 is defined as manifestations extending beyond three weeks from the onset of first symptoms and chronic covid-19 as extending beyond 12 weeks. For some people, some symptoms may linger or recur for weeks or months following initial recovery. This can also happen in people with mild disease. People are not infectious to others during this time. Persistent viraemia due to weak or absent antibody response, relapse or reinfection, inflammatory and dysregulated immune responses and mental factors such as post-traumatic stress disorder may all contribute. Long term respiratory, musculoskeletal, and neuropsychiatric sequelae have been described for other corona viruses (SARS and MERS), and these have pathophysiological parallels with post-acute covid-19

These guidelines are issued regarding the setting up of COVID 19 convalescent clinics to ensure proper post covid management.

- **Post COVID clinics should be set up in all PHC/CHC/FHC.**
- **Post COVID Clinics to be set up at THQ/DH/GH and Medical Colleges. These clinics will function for referral patients.**



Implementation Plan

- I. Dy DMO (NCD) shall be the nodal in the district for setting up and facilitating post COVID Clinics. The Nodal officer shall be supported by SWAAS Nodal Officers. At the state level NCD nodal officer to co-ordinate the post COVID clinics in the State.
- II. Training division to prepare training materials and organize ToT and cascade of trainings to all Medical Officers. Faculty from State Medical Board to be invited for ToT. Training should be kept open for the Doctors from the private sector.
- III. Online training modules prepared by the team of Doctors of MCH Thiruvananthapuram may be used. Other additional information can be added based on the research and information availability from world over.
- IV. Post COVID clinics shall be made operational in all PHC/FHC/THQ/DH/Medical Colleges at specific time on fixed days (eg 12-2 pm every Thursday]
- V. All COVID-19 recovered patients in the field area shall visit the nearest PHC/FHC/CHC and be followed up monthly in the post COVID clinics at PHC/FHC/CHCs.
- VI. Field staff, ASHA Workers to be sensitized regarding Post COVID clinics and they shall mobilize beneficiaries to the concerned clinics. A proactive record of health status of people not attending post COVID clinics shall also be documented.
- VII. At THQ/DH/GH/ Medical Colleges, a team of doctors to be formed to manage referrals from post COVID clinics from PHC/CHC/FHC. A nodal officer to be identified and intimated to all doctors at periphery.
- VIII. Telemedicine platform shall be extensively used for obtaining specialist consultation from clinics at THQ/GH/DH/Medical College for those who required it from PHC/FHCs/ CHCs.



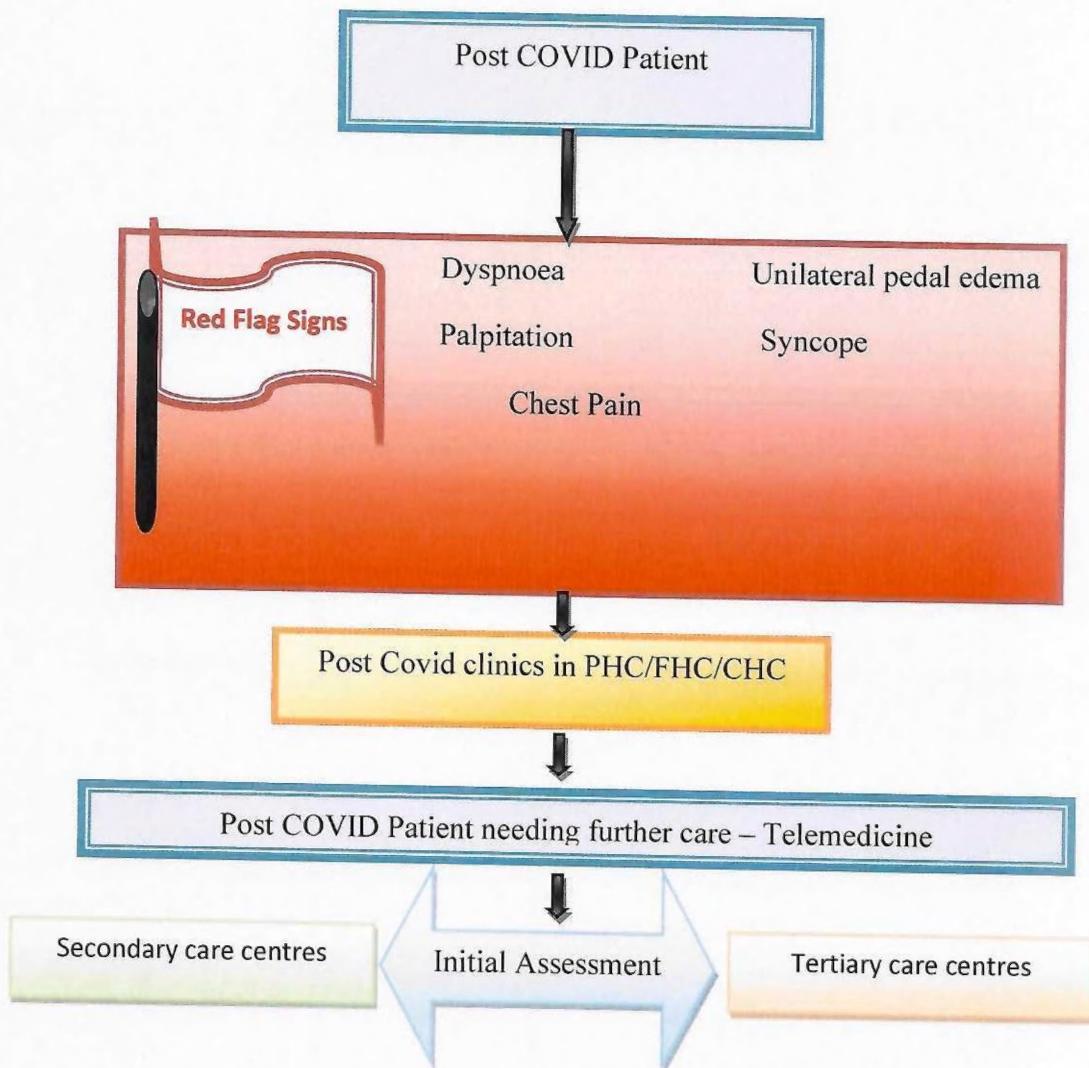
- IX. Specific Clinic timing on eSanjivini platform for Post COVID clinic to be earmarked to conduct the post COVID clinic.
- X. Those patients who require specialist follow up like pulmonary rehabilitation for lung fibrosis, neurological rehabilitation for stroke syndromes, cardiology follow up for ventricular dysfunction, cardiomyopathy etc should be referred for specialist services at DH/GH/ Medical Colleges.
- XI. Patients requiring pulmonary rehabilitation shall be linked to SWAAS clinics. Further follow up should be optimized using telemedicine from these centers.
- XII. Any patients with severe complications shall be linked to COVID hospital from which they obtained treatment. Support of Institutional / State Medical Board might be sought in such cases.
- XIII. Wide publicity to be given through Mass Media and PRD regarding post COVID clinics and services.
- XIV. A register needs to be maintained at every health institution with one page dedicated to one individual attending post COVID clinics. To the best possible extent all clinical details to be recorded.
- XV. DHS and DME shall issue necessary orders and monitor the implementation of activities.
- XVI. **Technical Notes on –**
A Telemedicine
B. Post COVID syndromes, its identification and management are attached as annexure.


Principal Secretary



TELE MEDICINE PLATFORM FOR RISK STRATIFICATION TO AVOID CROWDING IN POST COVID CLINICS

Telemedicine platform may be used for the patients needing consultation at Taluk Hospital post covid clinic or GH/DH/MCH Clinic based on the clinical condition assessment.

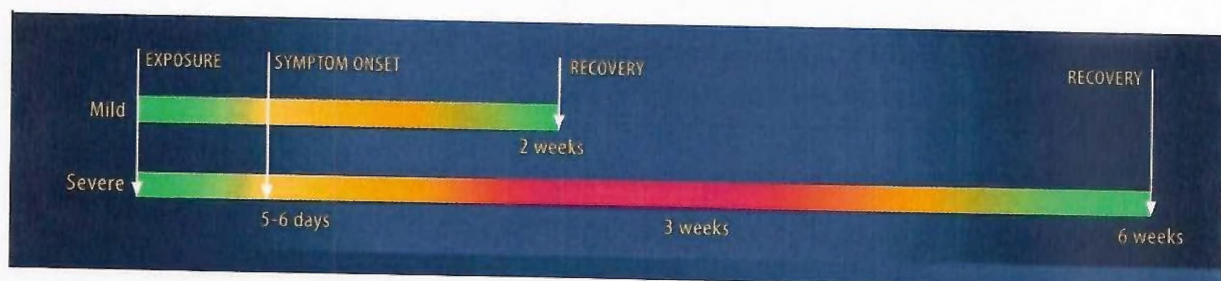




Annexure 1: Technical Notes on Post COVID syndromes and its management

Post-acute covid-19 ("long covid") is multisystem disease, sometimes occurring even after a relatively mild acute illness. Post-acute covid-19 is defined as manifestations extending beyond three weeks from the onset of first symptoms and chronic covid-19 as extending beyond 12 weeks. Clinical management requires a whole-patient perspective. Pathophysiology of post covid syndrome with its myriad multisystem manifestations is postulated to be persistent low-level inflammation or relapsing inflammation due to dysregulated immune responses. Broadly, such patients can be divided into those who may have serious sequelae (such as thromboembolic complications) or MIS-C (in children) and those with a non-specific clinical picture, often dominated by fatigue and breathlessness.

- Most people with COVID-19 experience mild symptoms or moderate illness.
- Approximately 10-15% of cases progress to severe disease, and about 5% become critically ill.
- Typically, people recover from COVID-19 after 2 to 6 weeks. (See figure below)
- For some people, some symptoms may linger or recur for weeks or months following initial recovery. This can also happen in people with mild disease. People are not infectious to others during this time.





- COVID-19 can sometimes result in prolonged illness, even in young adults and children without underlying chronic medical conditions.
- There are many case reports from people who do not regain their previous health following COVID-19.
- Around 10% of patients who have tested positive for SARS-CoV-2 virus remain unwell beyond three weeks, and a smaller proportion for months. This is based on the UK COVID Symptom Study, in which people enter their ongoing symptoms on a smartphone app. This percentage is lower than that cited in many published observational studies, whose denominator populations were those admitted to hospital or attending specialist clinics. A recent US study found that only 65% of people had returned to their previous level of health 14-21 days after a positive test.
- It is not known why some people's recovery is prolonged. Persistent viraemia due to weak or absent antibody response, relapse or reinfection, inflammatory and dysregulated immune responses and mental factors such as post-traumatic stress disorder may all contribute. Long term respiratory, musculoskeletal, and neuropsychiatric sequelae have been described for other corona viruses (SARS and MERS), and these have pathophysiological parallels with post-acute covid-19.

LONG COVID SYNDROME –MULTI-SYSTEM INVOLVEMENT

- Cardiovascular system-palpitation, myocarditis, cardiomyopathy, cardiac failure.
- Respiratory system-Lung fibrosis, pulmonary artery hypertension, pulmonary embolism.



- Nervous system- Anosmia, stroke syndromes, short term memory loss, reduced attention span, confusion, poor quality of sleep, cognitive impairment, and cognitive blunting [brain fogging].
- Mental health- Anxiety, depression, post-traumatic stress disorder and sleep disturbance
- Musculoskeletal and others –Polyarthralgia, polyarthritis, myalgia, excessive fatigability and chronic fatigue syndrome.

POST COVID REHABILITATION STRATEGIES PRIOR TO RESUMING INTENSE PHYSICAL EXERTION

After recovery from mild illness: 1 week of low level stretching and strengthening before targeted cardiovascular sessions.

- Very mild symptoms: limit activity to slow walking or equivalent. Increase rest periods if symptoms worsen. Avoid high-intensity training
- Persistent symptoms (such as fatigue, cough, breathlessness, fever): limit activity to 60% maximum heart rate until 2-3 weeks after symptoms resolve
- Patients who had lymphopenia or required oxygen need respiratory assessment before resuming exercise
- Patients who had cardiac involvement need cardiac assessment before resuming

Breathing Control exercises to manage Post covid cough

In the absence of signs or symptoms suggestive of bacterial superinfection or pleural inflammation, persistent cough may be managed by breathing control exercises.



About 80% of the work of breathing is done by the diaphragm. After illness or general deconditioning, the breathing pattern may be altered, with reduced diaphragmatic movement and greater use of neck and shoulder accessory muscles. This results in shallow breathing, increasing fatigue and breathlessness, and higher energy expenditure. The "breathing control" technique is aimed at normalising breathing patterns and increasing the efficiency of the respiratory muscles (including the diaphragm) resulting in less energy expenditure, less airway irritation, reduced fatigue, and improvement in breathlessness. The patient should sit in a supported position and breathe in and out slowly, preferably in through the nose and out through the mouth, while relaxing the chest and shoulders and allowing the tummy to rise. They should aim for an inspiration to expiration ratio of 1:2. This technique can be used frequently throughout the day, in 5-10-minute bursts (or longer if helpful).

Pulmonary rehabilitation for patients with persisting or exertional dyspnoea

Many patients are still recovering spontaneously in the first six weeks after acute covid-19 and do not generally require fast-track entry into a pulmonary rehabilitation programme. Those who have had significant respiratory illness may benefit from pulmonary rehabilitation, defined as "a multidisciplinary intervention based on personalized evaluation and treatment which includes, exercise training, education, and behavioural modification designed to improve the physical and psychological condition of people with respiratory disease.

Post Covid syndrome and Heart

Left ventricular systolic dysfunction and heart failure after covid-19 can be managed according to standard guidelines. Intense cardiovascular exercise must be avoided for three months in all patients after myocarditis or pericarditis; athletes are advised to take three to six months of complete rest from cardiovascular training followed by specialist follow-up, with return to sport



guided by functional status, biomarkers, absence of dysrhythmias, and evidence of normal left ventricular systolic function.

Neurological Sequelae

Ischaemic stroke, seizures, encephalitis, and demyelination have been described after covid-19, but these manifestations are rare. A patient suspected of these serious complications should be referred to a neurologist. Common non-specific neurological symptoms, which seem to co-occur with fatigue and breathlessness, include headaches, dizziness, and cognitive blunting ("brain fog"). These nonspecific symptoms need only supportive management and symptom monitoring in primary care.

Mental Health and well-being

Most publications on covid-19 and mental health have emphasized individual reactions to the pandemic such as anxiety, stress, and conditions related to broken routines, loneliness, and social isolation in uninfected individuals. Post-acute covid-19 is often associated with low mood, hopelessness, heightened anxiety, and difficulty sleeping. Post-traumatic stress disorder may occur, especially in healthcare workers and others with caring responsibilities.

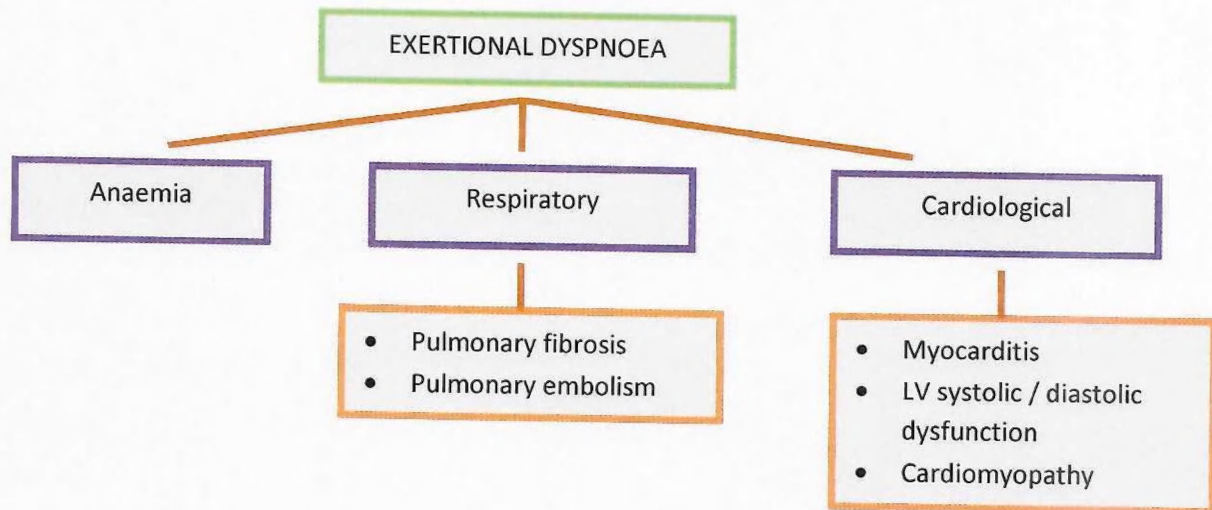
Post Covid syndrome in elderly

Covid-19 tends to affect older patients more severely. Those who survive are at high risk of sarcopenia, malnutrition, depression, and delirium. Post-covid-19 chronic pain may affect patients of any age but seems to be commoner in elderly patients. Physical symptoms add to the psychosocial impact of disrupted access to health care (such as arrangements for obtaining regular medication), core personal routines (such as walking to local shops), social interactions (such as meeting friends), and lay and professional support networks. Support should be personalised with input from the multi-professional team (for example, general



practitioner, nurse, social worker, rehabilitation teams, and occupational therapists].

ALGORITHMIC APPROACH TO ASSESSMENT OF POST COVID EXERTIONAL DYSPNOEA



FOCUSED INVESTIGATIONS

Haemogram, CRP, D Dimer

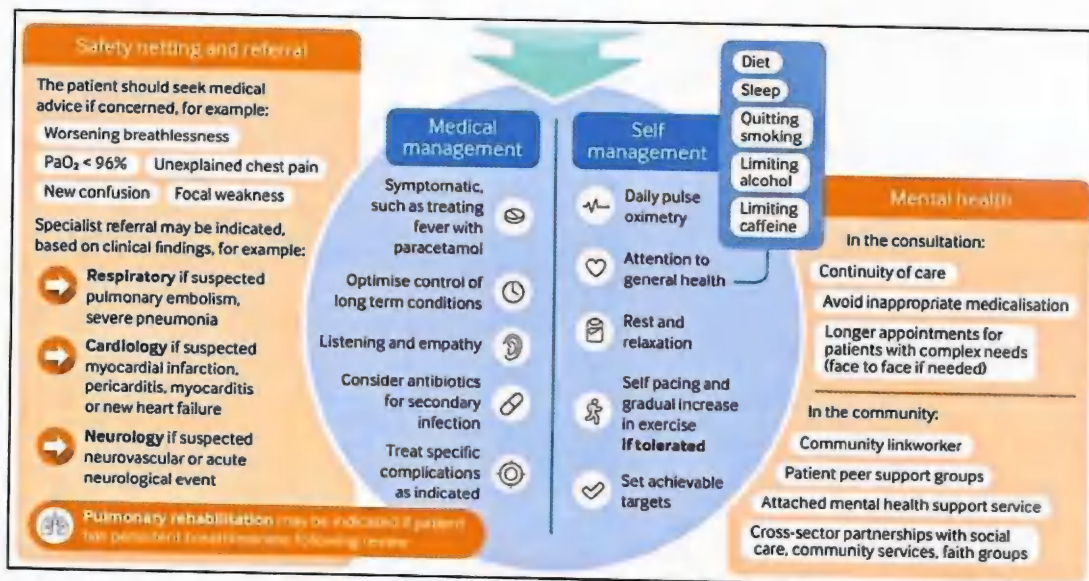
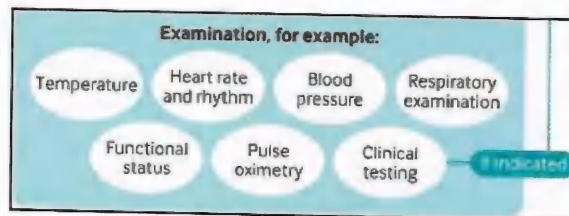
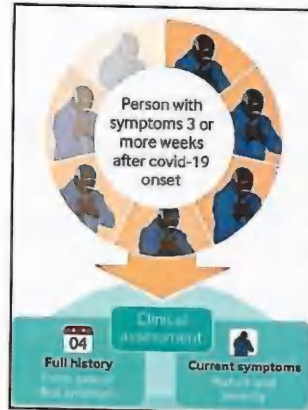
PFT, X Ray Chest, HRCT, ECHOCardiography

If D Dimer is elevated – CTPA

If All above investigations are normal – consider Cardiac MRI / Nuclear Scintigraphy



approach to management of long COVID syndrome in Post COVID clinics





REFERENCES

1. WHO EPI-WIN COVID Update 36– What we know about long term effects of COVID 19 - THE LATEST ON THE COVID 19 GLOBAL SITUATION AND LONG TERM SEQUELE. 9 September 2020
2. Trisha Greenhalgh, Matthew Knight, Christine A'Court, Maria Buxton, Laiba Husain. PRACTICE POINTER Management of post-acute covid-19 in primary care BMJ 2020;370:m3026 <http://dx.doi.org/10.1136/bmj.m3026> Published: 11 August 2020
3. del Rio C, Collins LF, Malani P. Long-term Health Consequences of COVID-19. JAMA. Published online October 05, 2020. doi:10.1001/jama.2020.19719



Post Covid syndrome in children: MIS-C

Multisystem inflammatory syndrome is one of the common post covid presentations in children usually presenting 3 - 4 weeks after acute infection. MIS-C may have three presentations:

MISC without overlap with acute COVID-19 or Kawasaki Disease, MIS-C overlapping with severe acute COVID-19 and MIS-C overlapping with KD. Children present with fever, laboratory evidence of inflammation with multisystem (≥ 2) organ involvement (cardiac, renal, respiratory, hematologic, gastrointestinal, dermatologic or neurological). Symptoms at presentation include gastrointestinal symptoms like abdominal pain, vomiting, diarrhoea, polymorphous rash, conjunctivitis, cardiogenic shock, cervical lymphadenopathy, neurocognitive symptoms, swollen hands and feet etc.

Many children with MIS-C meet the criteria for complete or incomplete Kawasaki Disease. MIS-C commonly affects older children and adolescents whereas classic KD typically affects infants and young children.

Positive inflammatory markers include one or more of the following: elevated CRP, ESR, fibrinogen, procalcitonin, ferritin, LDH or interleukin 6, elevate neutrophils, reduced lymphocytes and low albumin. Most children also have elevated D Dimer, Troponin T and NT pro BNP.

Children may be positive for SARS COV2 infection by RT PCR, antigen test, antibody test or may have history of exposure to suspected or confirmed case of Covid 19 case within 4 weeks prior to onset of symptoms.



Investigations

Patients with mild symptoms send Complete blood count including ESR, CRP, RFT, LFT.

If initial investigations abnormal send Ferritin, D Dimer, Troponin , NT pro BNP, LDH, IL- 6 (where available), PT INR.

Echo to look for coronary artery aneurysm and contractility.

Send for blood, urine and stool culture and investigations for Dengue, leptospirosis, Scrub typhus where indicated to look for alternate causes.

RT-PCR and serology for evidence of SARS COV2 infection.

MANAGEMENT

1. Supportive care including correction of shock with fluids and inotropes.
2. Empiric antibiotic for patients presenting with fever and critical illness.
3. IVIG (2g/kg) administered in a single dose infusion over 8-12 hours for patients presenting with features of KD or coronary dilatation especially younger age group. For patients with significant LV dysfunction it can be given over 2 - 3 days.
4. MIS-C patients presenting with cardiogenic shock especially in higher age group who are antibody positive may be treated with methyl prednisolone 30mg/kg/dose IV daily for 3 days followed by oral Prednisolone 2mg/kg/day until day7 or until CRP normalizes and then tapered over 2-3 weeks. IVIG may be given in non responding cases.
5. Patients with features of KD at high risk of IVIG resistance, IVIG and steroids (2mg/kg prednisolone for 10 days followed by 1mg/kg/day for 5 days) may be given concomitantly. Risk factors for IVIG resistance include enlarged CAs (Z-score >2.5 to 3) at presentation (prior to IVIG treatment), Age ≤12 months, with

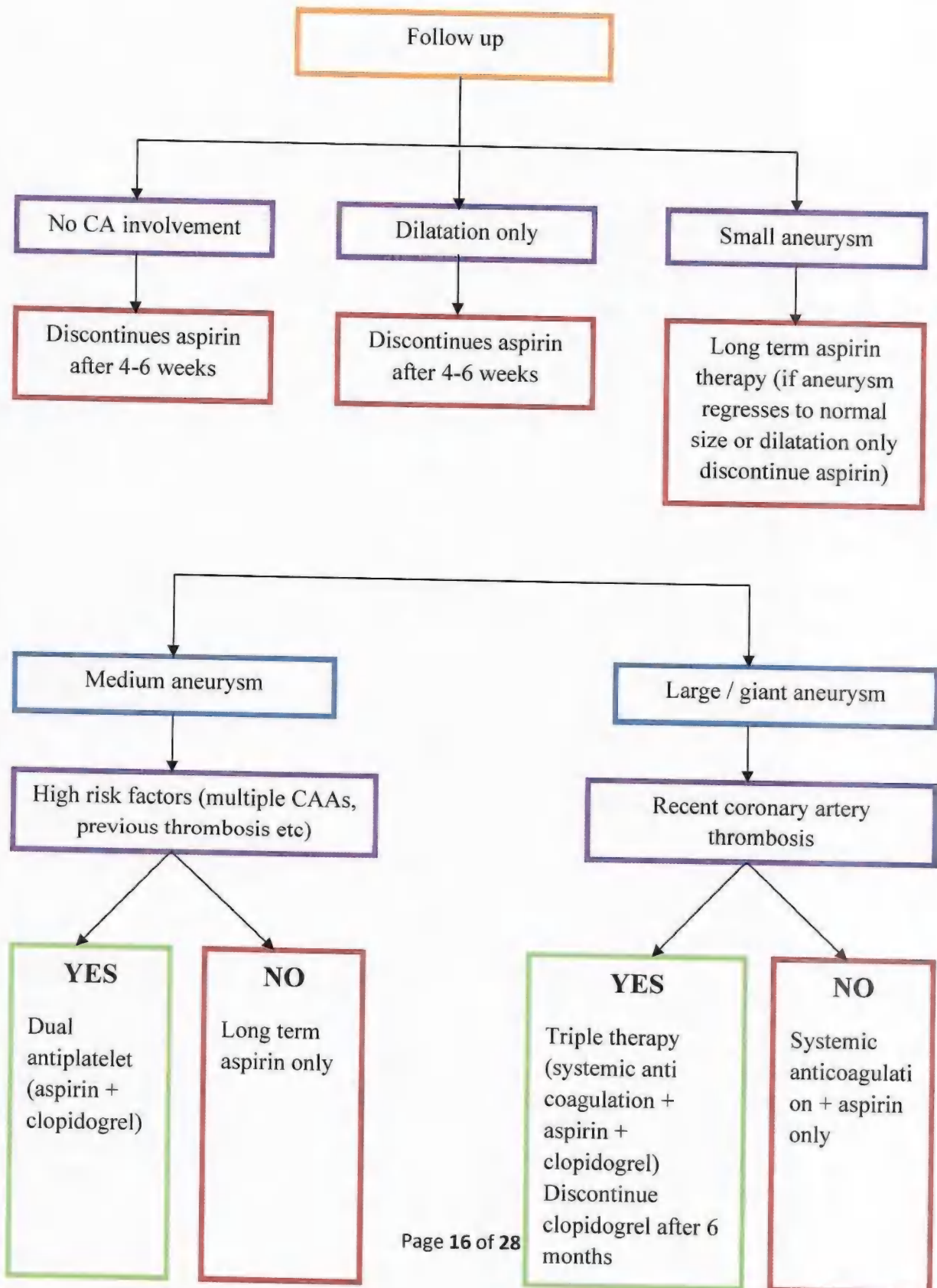


infants age <6 months at highest risk, KD associated with shock, KD presenting with macrophage activation syndrome

6. Refractory disease(persistent fever for > 36 hrs 2nd dose IVIG may be given. Other options in refractory cases include immunomodulators eg. Tocilizimab, Anakinra, Infliximab.

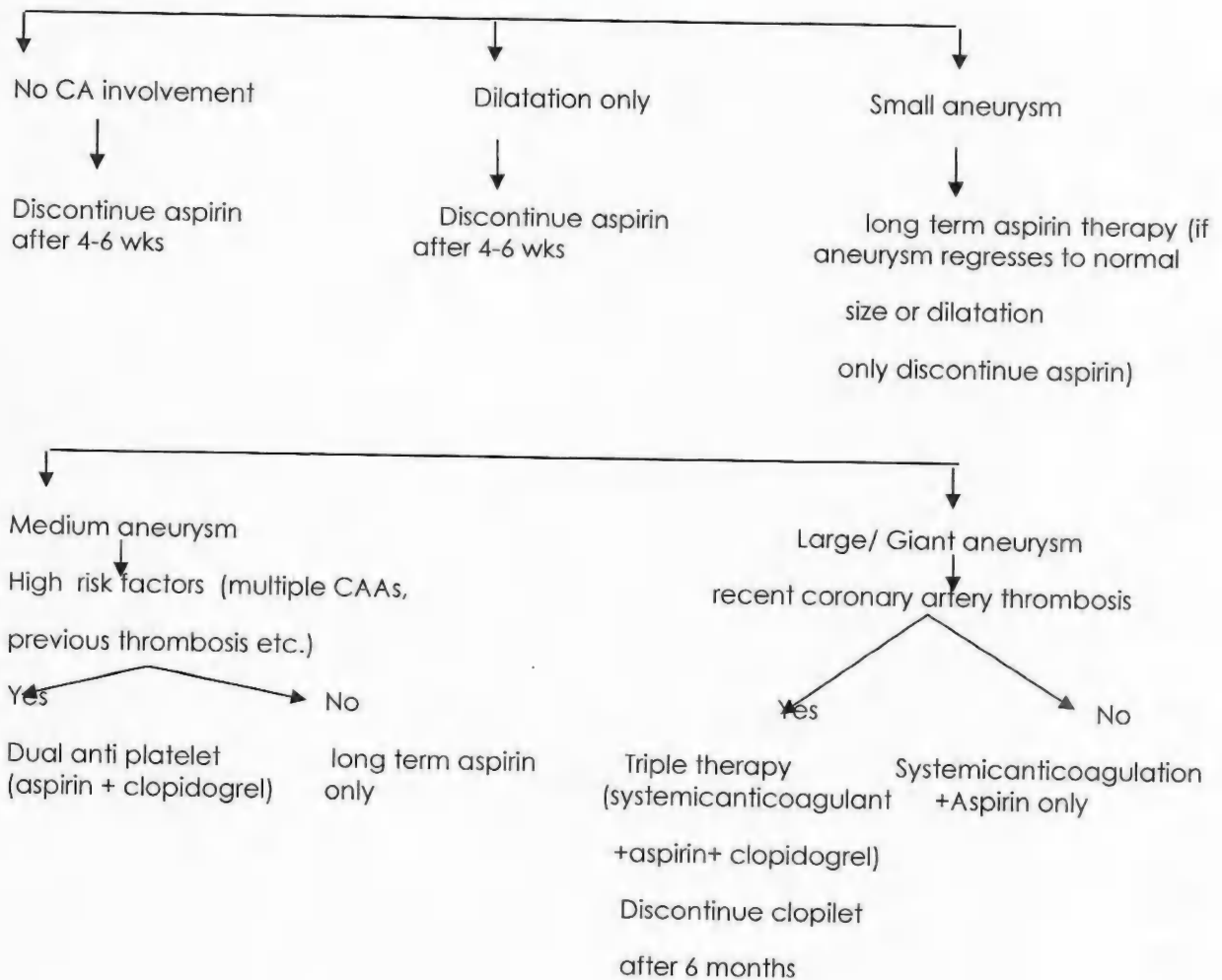
7. Anti inflammatory : Aspirin 30 -40mg/kg day in divided doses till 48 hours after fever subsides in children with KD like presentation followed by Aspirin 3 - 5mg/kg/day till ESR normalises if no coronary involvement.

8. Anti thrombotic therapy : Patients with MIS-C are at risk of developing thrombotic complications including apical ventricular thrombus, pulmonary embolism and coronary thrombosis. Low dose aspirin should be given to patients with features of KD and systemic anticoagulation is preferred in patients presenting with LV dysfunction.





Follow up





TIMING OF FOLLOW UP ECHO

Normal coronary artery dimension-Repeat Echo after 2 weeks.

Coronary artery dilatation/ Aneurysm - Repeat Echo at time of discharge, 2 weeks and 6 weeks.

Systolic dysfunction/ Myocarditis and normal coronaries on initial evaluation- Echo should be repeated at 2 weeks and 6 weeks.

All patients with evidence of systolic dysfunction/ myocarditis/ coronary artery involvement- Cardiac MRI may be done at 4-6 months to evaluate ventricular function and look for edema, diffuse fibrosis, and scar by myocardial delayed enhancement.

MIS-A [Multi system inflammatory syndrome in Adults]

Adult patients of all ages with current or previous SARS-CoV-2 infection can develop a hyperinflammatory syndrome resembling MIS-C. Although hyperinflammation and extrapulmonary organ dysfunction have been described in hospitalized adults with severe COVID-19, these conditions are generally accompanied by respiratory failure. In contrast, the patients with MIS-A have minimal respiratory symptoms, hypoxemia, or radiographic abnormalities. Hypoxemia observed in MIS-A is usually due to cardiogenic pulmonary edema due to myocarditis. This aspect helps to distinguish MIS-A from severe COVID-19.



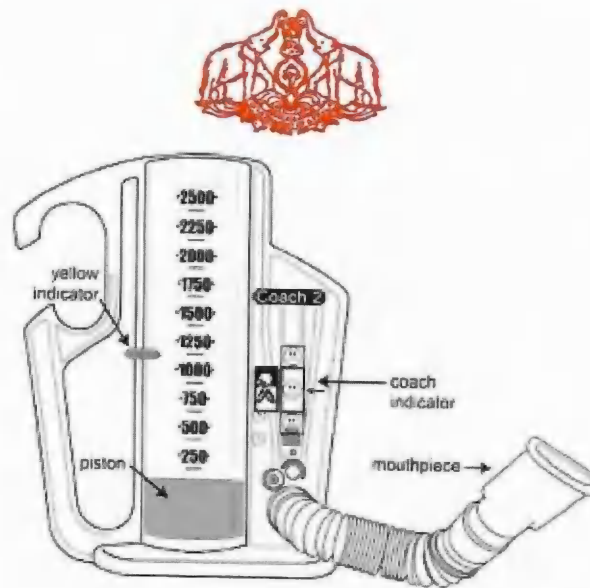
Working MIS-A case definition includes SIX criteria:

1. A severe illness requiring hospitalization in a person aged ≥ 21 years;
2. A positive test result for current or previous SARS-CoV-2 infection (nucleic acid, antigen, or antibody) during admission or in the previous 12 weeks;
3. Severe dysfunction of one or more extrapulmonary organ systems (e.g., hypotension or shock, cardiac dysfunction, arterial or venous thrombosis or thromboembolism, or acute liver injury);
4. Laboratory evidence of severe inflammation (e.g., elevated CRP, ferritin, D-dimer, or interleukin-6) and

Approximately 70% of patients with MIS-A have lab evidence of current or post COVID-19 (PCR or serology). Patients may have suspected exposure to COVID-19 case 3-4 weeks prior to MIS-A illness. Maintain higher index of suspicion in patients with higher risks for COVID -19 in the household.

endocarditis, auto immune conditions like SLE, vasculitis etc

discharge. An incentive spirometer should be obtained at discharge. The incentive spirometer is to be used for 15 minutes throughout the day, broken up into 3 sessions lasting 5 minutes each.



How to use the incentive spirometer

Sit upright in a chair or at the edge of your bed.

Hold the incentive spirometer in an upright position.

Breathe out normally.

Place the mouthpiece in your mouth and seal your lips tightly around it.

Breathe in slowly and as deeply as possible.

Notice the ball or piston rising toward the top of the column. Hold your breath as long as possible (at least for 5 seconds).

Take the mouthpiece out of your mouth and exhale slowly and allow the piston to fall to the bottom of the column.

Rest for a few seconds and repeat steps one to five at least 10 times.

Position the indicator on the side of the spirometer to show your best effort. Use the indicator as a goal to work toward during each slow deep breath.

After each set of 10 deep breaths, cough to be sure your lungs are clear.



Pulmonary rehabilitation includes breathing exercises as well as exercises to improve muscle strength. Home based exercise programmes are equally effective to hospital based therapy and are being encouraged.

Walking.

During the recovery period, it is advisable to maintain the following schedule for walking

- Week 1: 5 minutes, 5 times per day
- Week 2: 10 minutes, 3 times per day
- Week 3: 15 minutes, 2 times per day

Positioning

sitting upright as much as possible, walking around your space as tolerated, and changing positions regularly. Breathing on their stomachs with a pillow under their chest, can open up different parts of the lungs.

Monitoring

Preferably a Pulse Oximeter should be used to monitor heart rate and oxygen levels during activities and exercises .

Exercise Precautions

- BEGIN the exercise program after discharge from the hospital and if you are clinically stable.
- STOP exercise immediately if you get chest pain, palpitations, exhaustion, or dizziness/lightheadedness.



Exercise programme

The following exercises are recommended and can be performed in a graded manner in the following phases

Phase 1: Complete each exercise and rest in-between each exercise. Perform this circuit of exercises from start to finish one time, but repeat the circuit up to four times per day. As a suggestion, perform one set of exercises separated by a time period of 2-3 hours between each set, for a total of four times per day. Perform this for 7 consecutive days.

Phase 2: Complete each exercise and rest in-between each exercise. Perform this circuit of exercises two times, up to 2 times per day. As a suggestion, perform one set of exercises in the morning and one in the afternoon, for a total of two times per day. Perform this for 3 consecutive days. On the fourth day of this week, take a rest from the exercise program.

Phase 3: Complete each exercise and rest in-between each exercise, as prescribed. Perform this circuit of exercises three times consecutively, up to 2 times per day. As a suggestion, perform one set of exercises in the morning and one in the afternoon. Perform this for 3 consecutive days.

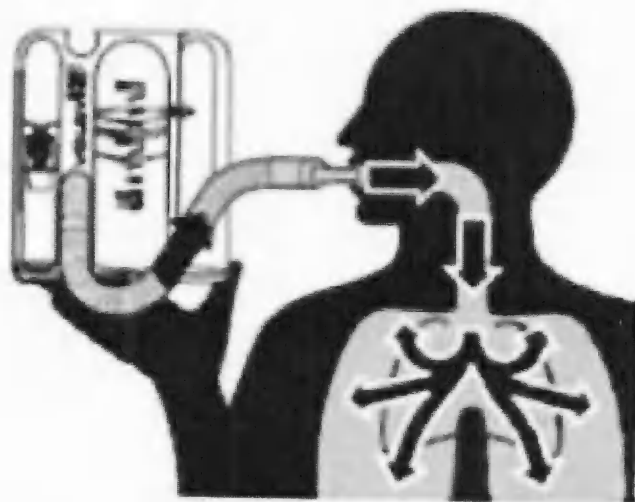
Exercise pattern

1. Diaphragmatic Breathing

Lie on your back with your head on a pillow and a pillow under the knees, or your knees may be bent. Put one hand on your chest and one hand on your belly. Breathe deeply through your nose, allowing your chest and belly to expand, and out through your mouth. Perform for 1 minute. Then, rest for 30 seconds. Duration -1 minute.



2. Incentive Spirometer Exercise Sit as tall as you can, with your shoulder blades pinched back, and your chest out. Breathe out completely, then with an incentive spirometer, slowly breathe in to your maximum inhalation, and slowly breathe out. Perform for 1 minute. Then, rest for 30 seconds. Duration 5 minutes



3. Sit to Stand Squats

Start by scooting toward the front of the chair. Next, lean forward at your trunk, reach forward with your arms and rise to a standing position. Lower your arms as you stand up. Use your arms as a counter-balance by reaching forward



when sitting down. Repetitively stand-up and sit-down for 30 seconds at a comfortable pace. Rest in a seated position for 30 seconds.



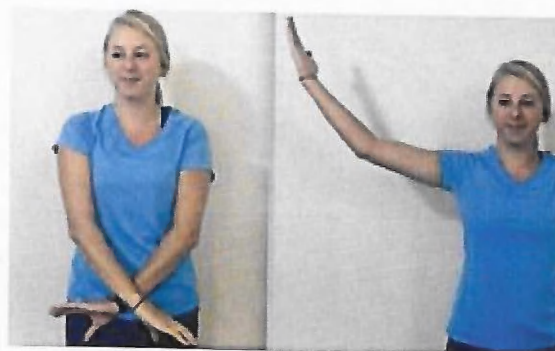
4. Standing Marching

While standing, draw up your knee with control, pause with your knee in the air for 2 seconds, then set it down and then alternate to your other side. Use one arm or both arms for support, if needed for balance and safety. Continue alternating each side continually for 30 sec. Rest in a seated position for 30 sec. Duration 30 sec



5. Seated Arm Reaches

In a seated position, begin by positioning your arms like the picture on the left, with your thumbs next to your opposite front pockets. Bring your arms up and across your body, turning your palms towards your face while slightly arching your back. End with your thumbs pointing backwards. Return your arms to the starting position and repeat. Continue this movement for 30 seconds. Rest for 30 seconds. Duration 30 sec





6. Standing Heel Raises

While standing, raise up on your toes as you lift your heels off the ground as high as you can. Pause for 2 seconds. Lower your heels to the ground with control. Continually repeat this full motion, up and down for 30 seconds. Rest for 30 seconds. Duration 30 sec



7. Sidestepping

Stand straight. Take a lateral step to one side. Follow with your other leg. Maintain your balance. Maintain proper posture and breathing. Repeat for the length of your counter or dresser, or ~5 steps to one direction. Repeat going in the other direction. Continue sidestepping back and forth for 30 seconds total. Rest for 30 seconds. Duration 30 sec



8. Wall Pushups

Start with your hands on the wall and elbows and trunk straight. Slowly bend your elbows, lowering yourself towards the wall. Then slowly push away from the wall. Your hands should never be higher than the level of your shoulders. Repeat this exercise for 30 sec. Rest for 30 sec. Duration 30 sec



STAY HYDRATED DURING EXERCISE SESSIONS

Mental Health and Diet

- Engage in regular communication for social purposes while in isolation. Use phones, video calls, or social media to engage with family and friends.



- Avoid feelings of regret, resentment, loneliness, helplessness, and depression. Recognise that the patient is not to blame for the disease.
- Eating a healthy diet, engaging in the exercises , and getting good sleep will improve your outlook and feelings of well being.
- Many people require emotional support in these circumstances. If you need to speak to someone immediately, call DISHA Mental health team.
- Aim for at least 7 hours of sleep per night.
- Exercise during the daytime, which will help you feel more tired at night.
- Avoid caffeine after noon. Caffeine lasts in your body for many hours, and affects your sleep long after last use.
- Avoid alcohol, as it reduces REM sleep and also causes you to wake up at night to urinate.
- Avoid blue light exposure for at least 1 hour prior to bedtime by enabling night shift mode on your phone or laptop, turning off the TV.
- Aim to go to bed the same time each night and rise the same time each morning. Avoid spending any time awake in your bed during the day, and, if possible, avoid napping during the day

Reference

1. *Recovering from COVID-19 : A patient Guide: Columbia University Irving Medical centre: New York-Presbyterian Rehabilitation Medicine.*
2. *John Hopkins Medicine: Corona virus Recovery Breathing Exercises*